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ABSTRACT

This memorandum reports the validation of the SCRDT Tests for Teachers in Spanish/English Bilingual Education Programs. The tests, which are designed for elementary and secondary teachers and aides, measure knowledge of methods used in teaching English as a second language (ESL), teaching Spanish as a second language (SSL), and teaching reading in Spanish; and they measure proficiency in standard Spanish and acquaintance with the non-standard varieties of Spanish found in the southwestern United States. The results of a scale designed to measure teachers' attitudes toward varieties of Spanish used in the Southwest are also reported. The tests, the attitude scale, and a questionnaire covering the language use patterns, personal history, professional preparation, and expertise of the participants were administered to 83 teachers and 64 teachers' aides working in bilingual education programs in 31 schools at 3 sites in the Southwest. At all three sites teacher and aide scores on proficiency in standard Spanish had a significant positive relation to pupil gains; scores on the ESL, SSL, and Spanish Reading Methods tests did not. (Author/MV)

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TOWARD VALIDATION OF TESTS FOR TEACHERS IN SPANISH/ENGLISH BILINGUAL EDUCATION PROGRAMS

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Introductory Statement

The mission of the Stanford Center for Research and Development in Teaching is to improve teaching in American schools. Current major operations include three research and development programs--Teaching Effectiveness, The Environment for Teaching, and Teaching and Linguistic Pluralism--and two programs combining research and technical assistance, the Stanford Urban/Rural Leadership Training Institute and the Hoover/Stanford Teacher Corps Project. A program of exploratory and related studies provides for smaller studies that are not part of the major programs.

This report is part of the work of the Program on Teaching and Linguistic Pluralism.

Contents

Abstract iv

Introduction 1

Review of the Literature 3

Relation of Teacher Knowledge to Pupil Achievement 3
Relation of Teacher Attitudes to Pupil Achievement 5

Description of Teacher Tests for Spanish/English Bilingual Education . . 5

Spanish Proficiency 5
Methods of Teaching Reading in Spanish 7
Methods of Teaching English as a Second Language and Methods of Teaching Spanish as a Second Language 7
Spanish of the Southwest 8

Field Test Procedures 9

Data Collection 9
The Subjects 10
The Pupils 12
Procedures for Administering the Teacher Tests 13

Method of Analysis 14

Reliability 14
Validity 14

Results 20

Spanish Proficiency 20
Methods of Teaching Reading in Spanish 20
Methods of Teaching English and Spanish as Second Languages 23
Spanish of the Southwest 23

Conclusions 24

References 26

Appendixes 29

Abstract

This memorandum reports the validation of the SCRDT Tests for Teachers in Spanish/English Bilingual Education Programs. The tests, which are designed for elementary and secondary teachers and aides, measure knowledge of methods used in teaching English as a second language (ESL), teaching Spanish as a second language (SSL), and teaching reading in Spanish; and they measure proficiency in standard Spanish and acquaintance with the non-standard varieties of Spanish found in the southwestern United States. The results of a scale designed to measure teachers' attitudes toward varieties of Spanish used in the Southwest are also reported.

The tests, the attitude scale, and a questionnaire covering the language use patterns, personal history, professional preparation, and expertise of the participants were administered to 83 teachers and 64 teachers' aides working in bilingual education programs in 31 schools at 3 sites in the Southwest.

On the basis of their test scores, teacher-aide teams were categorized as follows: (1) high-performing teacher, high-performing aide; (2) high-performing teacher, low-performing aide; (3) low-performing teacher, high-performing aide; (4) low-performing teacher, low-performing aide. The relationship between the teacher-aide "team" performance and pupils' gains on several criterion measures was analyzed in two ways. First, an analysis of variance was performed to determine whether the four types of teams differed significantly in terms of class gains; second, correlations were computed between class gains and teachers' and aides' test scores.

At all three sites teacher and aide scores on proficiency in standard Spanish had a significant positive relation to pupil gains; scores on the ESL, SSL, and Spanish Reading Methods tests did not. At one site, the teachers with high scores on the writing section of the Spanish Proficiency Test had students who achieved significant gains on measures of reading and language arts; the aides' high performance on another section of the Spanish Proficiency Test was significantly and positively related to students' gains in reading. At two sites, scores on Spanish Reading Methods were significantly and negatively related to pupil gains in both reading and language arts; scores on the ESL test were significantly and negatively related to reading gains; and scores on the SSL test were significantly and negatively related to language arts gains.

The test of Spanish of the Southwest and the scale measuring attitudes toward Southwest Spanish were administered in only one site. The attitude scale was significantly related to pupil gains: a positive attitude on the part of the aides, but not the teachers, significantly contributed to pupil gains in reading.

The teachers who were well prepared in methods and linguistics and who performed well on the ESL, SSL, and Spanish Reading Methods tests were, by and large, Anglo-Americans for whom English was the primary language; most

of the teachers and aides who performed well on Spanish Proficiency were of hispanic background and used Spanish frequently at home.

The main result of this investigation is that of all the teacher tests, only the Spanish Proficiency Test proved to be a positive and significant predictor of pupil gains on criterion tests.

TOWARD VALIDATION OF TESTS FOR TEACHERS IN SPANISH/ENGLISH BILINGUAL EDUCATION PROGRAMS

Bárbara J. Merino and Robert L. Politzer

Introduction

This report will outline the attempt to validate Teacher Tests for Spanish/English Bilingual Education developed at the Stanford Center for Research and Development in Teaching. (For a history of the development of this battery of tests, see Merino, 1976.) These tests are designed for teachers and aides working in bilingual education programs in elementary and secondary schools. The battery consists of five tests measuring knowledge of methods used in teaching English and Spanish as second languages and in teaching reading in Spanish as well as competence in standard and Southwestern varieties of Spanish. Principally for research purposes we developed three attitude scales to measure teachers' attitudes toward varieties of Spanish and the speakers of those varieties as well as their attitudes toward various language teaching methods.

In the Southwestern United States there are approximately 1.75 million primary, intermediate, and secondary school Mexican-American students (Galarza, Gallegos, & Zamora, 1969). The median number of years of school attendance for this group among persons fourteen years old or older, by state, is as follows: Arizona, 8.3; California, 9.2; Colorado, 8.7; New Mexico, 8.8; and Texas, 6.7. Many Mexican-American students are two, three, or even five years behind in school (Carter, 1970). For many years the

students themselves have been viewed as the cause of this deficit. Efforts to improve student achievement have focused on remedial programs that attempt to change or acculturate the students. Recent research, however, has shown that minority children do not fail because of deficiencies on their part but because the public school system is oriented largely toward middle-class, English-speaking children and does not take into account the different learning styles, patterns of ability, and value systems of minority children (Cole and Brunner, 1971; Tulkin, 1972). In an effort to provide minority children with equal access to the educational process, the courts, through decisions such as Lau vs. Nichols in 1974 and Aspira vs. the Board of Education of the City of New York in 1975, are requiring that the schools provide special programs (often bilingual education programs) to meet the needs of these children. The degree of success these programs have, however, will depend in large part on the effectiveness of the teachers involved.

In an effort to determine what makes teachers effective in a bilingual school program, the Program on Teaching and Linguistic Pluralism at the Stanford Center for Research and Development in Teaching (SCRDT) began a three-year research program in September 1975. The first phase of this research effort, reported in this Memorandum, involved the production and validation of a series of tests designed to measure teachers' knowledge and skills in linguistics, teaching methods, and language, as they apply to Spanish/English bilingual education programs. In the second phase, now in progress, teacher-student interaction in the classroom is being observed and teacher behavior will later be analyzed and measured to determine effective methods of promoting student achievement. In the third and final phase, teachers will be trained through in-service workshops in those skills

pinpointed by our research as the skills likely to maximize their effectiveness and improve their students' achievement.

One frequently used method of establishing the validity of a test is to validate it against a criterion. Performance on the job is a common kind of criterion. In the case of teachers, investigators have studied the relationship of teachers' knowledge (as measured by a test or as established by their professional preparation) or teachers' attitudes (as determined by attitude scales) and their students' gains in achievement. What follows is a brief overview of previous attempts to establish the relation of teachers' knowledge and attitudes to pupil gains in language skills or academic subjects.

Review of the Literature

Relation of Teacher Knowledge to Pupil Achievement

In outlining recommendations for teacher training and the certification of bilingual teachers, private and state agencies have suggested that potential teachers demonstrate an ability to teach the curriculum in Spanish, be knowledgeable about methods of teaching Spanish and English as second languages and show familiarity with the varieties of Spanish used in the southwestern United States (see, for example, California State Department of Education, 1974; Center for Applied Linguistics, 1974). The belief that teachers cannot teach what they do not know makes common sense. Nonetheless, attempts to relate teachers' knowledge of subject matter to student achievement have had mixed results. Rosenshine (1971), in his review of the relationship of presage teacher variables to student achievement, found the relationship between teachers' knowledge and student achievement to be

negligible, inconsistent, and not statistically significant except in two studies.

It may be that "teacher knowledge" has been too broadly defined by researchers. In a recent study Lawrenz (1975) found that whereas teacher knowledge of the processes of science was positively related to student achievement, teacher subject matter knowledge, as measured by the National Teachers Exam in Science, was negatively related to student achievement.

Teacher knowledge may be more important at certain grade levels than at others. Heim and Lewis (1974) reported that in grades K-3 neither teacher experience nor degree (indirect measures of knowledge) effects student achievement, but that in grades 3-6 both have an effect.

With foreign language teachers, knowledge of the subject matter (i.e., the foreign language) as measured by the Modern Language Association-Educational Testing Service battery has been shown to have no relationship to student achievement (Smith, 1968). Politzer and Weiss (1971) reported that only the MLA-ETS Listening subtest had a significant relationship to student achievement in French.

The relationship between teacher knowledge and pupil achievement is not a simple one. It seems to be affected by the subject area, the socioeconomic background of the pupils, the reliability and validity of the tests used to measure teachers' competence, teachers' classroom behavior, teachers' attitudes toward pupils and subject matter, the personal characteristics of both teachers and pupils, and many other factors. Nonetheless it is clear that teachers' knowledge of subject matter and methodology must be taken into account in determining teaching effectiveness. Ultimately the central issue is a teacher's effectiveness in conveying his or her knowledge to the students.

Relation of Teacher Attitudes to Pupil Achievement

The literature is rich on the effects of teachers' attitudes on their interactions with and evaluation of their pupils (see Brophy & Good, 1974, for a review). Teachers' attitudes may be influenced by the pupils' sex (Hess, Shipman, Brophy & Bear, 1969), race (Robovits & Maehr, 1973), personality (Feshbach, 1969), physical attractiveness (Dion, 1970), and speech (Seligman, Lambert & Tucker, 1972), among many other factors.

In the late 1960's the view was advanced that teachers' attitudes toward pupils influence teachers' expectations about pupils' skills and performance, resulting in precisely the kind of performance expected (Rosenthal & Jacobson, 1968). While some of these original findings have been questioned (Snow, 1969), recent studies seem to indicate that teachers do indeed bias children's learning (Dusek, 1975). There is some indication, moreover, that in a bilingual setting, teachers' attitudes toward code-switching (using both English and Spanish in the same utterance) may have a negative relation to their pupils' achievement in reading (Ramírez, Arce-Torres, & Politzer, 1976).

Because of the influence teachers' knowledge and attitudes are likely to have on pupil achievement (albeit in combination with other factors) we decided to concentrate our efforts in the first phase of our research on the development of tests and attitude scales for teachers in bilingual education.

Description of Teacher Tests for Spanish/English Bilingual Education

Spanish Proficiency

This test is divided into five sections: (a) elementary writing proficiency, (b) content area passages, (c) use of realia, (d) oral proficiency,

and (e) writing proficiency. In section (a) the teacher is given a series of sentences to be completed in writing, requiring the use of key grammatical structures. In (b) teachers are asked to complete passages taken from teachers' manuals and texts by filling in each blank with one word.[1] In (c) teachers are asked to identify (in writing) pertinent nomenclature peculiar to each of several subject areas, using the realia (figures and objects) typical of that subject area. In (d) information is orally presented in English to the teacher, who is then asked to convey the information to someone who speaks only Spanish.[2] In (e) teachers are asked to write a note to the parents of a student: grammar, vocabulary, sociolinguistic appropriateness, and communicative competence are considered in scoring the notes.

Sections (a) and (b) and part of section (c) comprise a total of 114 objective items. This objectively scored portion of the test is henceforth referred to as General Spanish proficiency. Sections (d), (e), and the language arts portion of (c) are rated separately because they involve open-ended responses.

A sample from section (b) of Spanish Proficiency (SP) follows:

Completar las siguientes oraciónes con la palabra adecuada:

"Según la mito logía, a un cuento que se ha transmitido de generación a generación, a veces por cientos de años, se le llama leyenda. Ciertas gentes creen en ella, pero no es necesariamente verdadera."
"La leyenda de La Lorona," _____ la meastra entusiasmadamente, "vienne de la _____ norte de México, pero también se _____ en las selvas del Brasil."

---

[1] The passages are representative of teachers' guides and textbooks in math, social studies, and language arts. Sections for science, art, and music have been written but were not administered to the subjects of this study.

[2] This part of the test was not administered.

Methods of Teaching Reading in Spanish

This test consists of both multiple-choice and true-false items. The test focuses on methods of teaching reading in both Spanish and English, differences between English and Spanish as writing systems, and recent research dealing with effective reading techniques. A sample item follows:

Which of the following groups of words do not contain Spanish diphthongs?

a. viuda, causa, familia

b. feo, aeroplano, lea

c. ciudad, deuda, jaula

d. nieto, reina, nuevo

This test also includes a 30-item attitude scale intended to measure attitudes toward methods and techniques used in the teaching of reading in Spanish. For example:

With bilingual children, the teaching of reading simultaneously in Spanish and English is sound methodology.

1	2	3	4	5
Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree

Methods of Teaching English as a Second Language and Methods of Teaching Spanish as a Second Language

Both of these multiple-choice tests are in two parts. In the first part the teachers are asked to identify errors either by their source (interference, developmental error, or misapplication of the rules of English or Spanish) or by the structure affected. In the second part they are asked to identify the rule that best explains the error. There are 35 items for each language. A sample item from Methods of Teaching Spanish as a Second Language (SSL) Language follows:

1. Substitutions such as tení for tuve and vení for vine

   a. result from English language interference.

   b. indicate that the SSL student is familiar with the process of preterite formation.

   c. stem from failure to distinguish between Spanish preterite and imperfect tenses.

   d. follow no known pattern.

A sample item from Methods of Teaching English as a Second Language (ESL) follows:

1. If a teacher wants to give an explanation to a student who says I have much pencils in my desk, on which of the following should the teacher base his or her explanation?

   a. English has two ways of expressing mucho.

   b. The use of much instead of many is inappropriate because pencils requires many.

   c. Many is used with the plural forms of count nouns (books, desks) and much is used with noncount or mass nouns (water, time, sugar).

   d. The confusion in the use of much and many is due to Spanish.

An attitude section was also developed to measure teachers' attitudes toward methods used in the second language classroom. A Likert-type scale was used. A sample item from the attitude scale follows:

1. In a second language classroom it is important for the teacher to develop all four skills--listening, speaking, reading, and writing--simultaneously.

1	2	3	4	5
Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree

Spanish of the Southwest

This multiple-choice test measures knowledge of the lexicon, grammar, morphology, phonology, and syntax of varieties of Spanish spoken in the

Southwest, as well as sociolinguistic principles that apply to bilingual communities, such as language change, interference, and standardization. The test consists of 40 items. An item from the test follows:

1. Cuál de las cosas abajo citadas no corresponde a las otras?

   a. tramos

   b. calcos

   c. lisa

   d. güisa

A 20-item scale evaluates teachers' attitudes toward standard and nonstandard varieties of Spanish and their place in the classroom. An item from the test follows:

Cuando los alumnos dicen "Polccía" hay que corregirlos inmediatamente.

1	2	3	4	5
Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree

The procedures whereby we attempted to validate the five teacher tests are listed below.

Field Test Procedures

Data Collection

We administered the test battery in three sites in the Southwest which we will call sites A, B, and C.[3] One site (A) is suburban, the other two urban. All three sites had high concentrations of either Latino or Chicano children enrolled in their school systems. Thirty-one schools participated: four at site A, 23 at site B, and four at site C.

[3]Because of the confidential nature of the data, the sites are not identified.

Table 1 shows the distribution of participants by site, sex, and role in school.

TABLE 1

Distribution of Subjects

Subjects	Site A	Site B	Site C	Total
Teachers	23	43	17	83
Aides	23	41	0	64
Women	38	58	15	111
Men	8	26	2	36
Total	46	84	17	147

School district officials selected the participants in our study, choosing teachers and teacher aides for whose pupils we could have both pre- and posttest data. The participants completed questionnaires on their background, professional preparation, experience, and language use patterns.

For the purpose of establishing the reliability of the tests, we used data obtained from all participating teachers and aides. For the validation study, however, not all data could be used, since at one site some teachers not actually engaged in teaching bilingual pupils took the tests. For site C (in which only one test was administered) data on pupil achievement and teacher characteristics became available too late for inclusion in this report.

The Subjects

Table 2 reports the responses to the background questionnaire. The majority of the teachers and aides who participated in the study were born in the southwestern United States, though in site B a significant number were born in Latin America (hereafter they are referred to as Latinos).

TABLE 2

Teacher and Aide Characteristics (Sites A and B)

Teacher and Aide Characteristics	Site A	Site B
Ethnic background		
Mexican-American	31	24
Other Latino	3	41
Asian-American	3	2
Afro-American	1	1
Anglo-American	8	13
Birthplace		
Southwest USA	36	30
Other USA	5	9
Mexico	3	10
Other Latin American	2	35
Childhood		
Southwest	34	33
Other USA	4	11
Mexico	6	10
Other Latin America	2	30
Language use with parents		
English	13	20
Spanish	16	33
Both	15	31
Missing data		1
Language use with children		
English	11	12
Spanish		7
Both	22	42
Not applicable	13	24
Professional preparation[a]		
ESL	12	54
SSL	15	36
Linguistics	12	55
Spanish literature	24	68
Reading methods	25	58
Dialect varieties	10	26
Bilingual education	31	38

[a]We report the number of teachers who reported having taken the courses listed; we did not, however, get answers from all teachers in site B.

About half of the teachers and aides were of Mexican-American background. The others were either Latino (but not Mexican-American) or Anglo-American. About half of the subjects who participated in the study used both English and Spanish with their children at home. About a fourth used English only, and a very few used Spanish only. The language use patterns of the teachers' parents were more evenly distributed: approximately equal numbers of our subjects used English only, Spanish only, or both English and Spanish in interacting with their parents. Approximately half of the subjects had had courses in English as a Second Language (ESL) and Spanish as a Second Language (SSL). A little more than half had had some preparation in linguistics and bilingual education and almost three-fourths had taken courses in Spanish literature and reading methods. Very few of those who participated had had any preparation in Spanish dialect varieties.[4]

The Pupils

The key question in this study is "What is the relationship of teachers' knowledge and attitudes to pupil achievement?" Pupil achievement was measured by the following tests: the Comprehensive Test of Basic Skills (CTBS), the SCRDT Spanish/English Balance Tests, and the Inter-American Test of Comprehension of Oral Language. The school district personnel shared these test scores with us but did not do any additional testing. Our pupil data therefore represent whatever was available as part of the normal evaluation procedures undertaken by the districts. (The administration of the SCRDT Spanish/English Balance Test at site B was part of the general evaluation procedure used by the school district.)

[4]Information on these variables and their relationship to performance on the teacher tests will be published later in 1977.

Pupils at all three sites had taken the Comprehensive Test of Basic Skills. The CTBS is intended to measure systematically skills prerequisite to studying and learning. It does not measure achievement in specific course content as reflected in textbooks for various grade levels. The objectives of the test are classified under five broad intellectual processes: recognition, translation, interpretation, application, and analysis. The CTBS battery contains multiple-choice tests in six skill areas. For this study we drew on only the reading and language scores.

At site B the pupils had taken the grammar subsections of the SCRDT Spanish/English Balance Tests (unpublished). These tests use pictures and/or spoken cues to elicit responses. We used pupils' scores on the 20-item Multiple-Choice Grammar Test (in Spanish and in English), which measures pupils' ability to recognize grammatical structures in Spanish and English.

At site A the pupils had taken the Interamerican Test of Comprehension of Oral Language (Comprensión del Lenguaje Oral). This test measures pupils' ability to comprehend short oral expressions. Pupils are provided with an oral stimulus and must select a picture (one out of four) that best illustrates the oral stimulus. The test consists of 35 items; parallel forms of the test can be administered in Spanish and English. We used scores on the Spanish version as the measure of Spanish achievement.

Procedures for Administering the Teacher Tests

In general, administration of the test battery at the three sites followed a standard procedure. The tests were administered after school hours in two 2-1/2 hour workshops. First the goals of the research project were outlined to the teachers and teacher aides. Then the participants were asked to complete the questionnaire mentioned above. Then the tests and

attitude scales were administered. A brief discussion period and a break followed each test. In one site the tests were administered on two different days. All participants received an honorarium.

Method of Analysis

Reliability

The reliability of each of the teacher tests was determined by establishing the internal consistency measure of Cronbach's α: Biserial correlations for each test item were calculated, and after each test some items with low or negative biserial correlations were eliminated. (The number of test items and the test reliabilities reported in this publication refer to the somewhat shortened tests from which the most unreliable items have been dropped.) Mean scores and test reliabilities are shown in Table 3. As can be seen from the table, all the revised tests showed rather high reliability with the possible exception of Spanish Reading Methods, which may need further improvement or refinement.

Validity

The attempted validation of the teacher tests involved the establishment of the relationship between two sets of variables: the teachers' and aides' scores on the tests and the gains made by pupils on several achievement measures. The first set of variables is briefly described in Table 4, which shows the mean scores achieved by teachers and aides in sites A and B on Spanish Proficiency (note that total test scores as well as subscores in language arts and writing proficiency are given), the ESL and SSL Methods tests, and the test on Spanish of the Southwest.

TABLE 3

Summary Results of Administration of Teacher Tests
(Sites A, B, C)

Test	Number of Subjects	Number of Items	Mean Score	SD	Cronbach α
General Spanish Proficiency (GSP)[a]	115	114	64.8	24.1	.92
Spanish Reading Methods (RM)	125	31	18.9	4.6	.74
English as a Second Language (ESL)	140	35	18.7	6.9	.86
Spanish as a Second Language (SSL)	90	35	14.5	6.0	.81
Spanish of the Southwest (SW)	45	40	17.1	6.1	.81

[a]Subsections (a), (b), and (c) of the Spanish Proficiency Test.

The second set of variables--pupil gains--is described in Tables 5, 6, and 7. In order to calculate pupil gains, the pupils' 1976 scores were regressed over their 1975 scores. On the basis of the regression, each pupil was assigned a relative gain score (difference between actual 1976 score and an expected score based on the line of regression of 1976 over 1975 scores). Mean relative gain scores for each class were then established.

On the basis of the teachers' and aides' test scores, teacher-aide teams in sites A and B were assigned to one of four groups: (1) high performing teacher, high performing aide; (2) high performing teacher, low performing aide; (3) low performing teacher, high performing aide; (4) low performing teacher, low performing aide. We first performed an analysis of variance on the relationship between the teacher-aide teams' performance on the tests and

TABLE 4

Means and Standard Deviations of Scores on Teacher Tests

	GSP			WP			RM			ESL			SSL			SW		
Site	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
A																		
Teachers	23	48.26	32.03	-	-	-	23	22.39	2.02	23	20.83	4.52	23	14.48	5.01	23	19.48	7.84
Aides	23	55.13	20.32	-	-	-	23	16.30	3.28	23	13.39	4.10	23	8.57	3.68	23	20.52	5.12
B																		
Teachers	27	68.26	21.37	20	5.70	1.30	25	22.20	3.59	26	23.35	4.30	27	16.07	6.07	-	-	-
Aides	13	64.69	24.32	11	5.96	1.42	16	15.69	3.86	16	11.81	6.34	-	-	-	-	-	-

Note: GSP = General Spanish Proficiency, sections (a), (b), and (c) of the Spanish Proficiency Test
WP = Writing Proficiency, section (e)

TABLE 5

Pupil Relative Gain Scores by Class and Grade
for Site A

	CTBS Reading				CTBS Language				Spanish Oral Comprehension		
Class	Rel. Gain Score	SD	N	Class	Rel. Gain Score	SD	N	Class	Rel. Gain Score	SD	N
Grade 1											
1	.39	.53	19	1	.20	.93	22				
2	.39	.39	22	2	-.40	.36	23				
3	-.31	.32	25	3	-.15	.38	24				
4	.47	.51	21	4	.36	.54	21				
5	-.05	.56	24	5	.12	.62	24				
6	.02	.50	18	6	-.11	.66	19				
Grade 2											
7	-.23	.20	18	7	-.06	.20	19	7	.06	.84	13
8	-.38	.18	19	8	-.11	.19	21	8	.83	.45	19
9	.57	.62	26	9	.24	.38	26	10	-.22	.71	17
10	-.07	.51	24	10	-.16	.41	22	11	-.15	.43	18
11	.05	.59	26	11	.07	.58	26	12	-.65	.84	18
Grade 3											
12	-.16	.73	20	12	-.17	.74	13	12	-.21	.77	11
13	.10	.59	11	13	.29	.59	11	13	.66	.68	10
14	-.31	.64	16	14	-.41	.78	17	14	-.22	.60	13
15	.13	.56	23	15	.09	.56	22				
Grade 4											
16	-.13	.43	32	16	.10	.50	32				
17	-.23	.57	14	17	-.30	.49	14				
18	.46	.58	29	18	.14	.54	28				
19	-.25	.40	24	19	-.13	.47	24				
Grade 5											
20	.01	.76	26	20	.13	.44	24				
21	.46	.57	24	21	.07	.45	24				
22	-.28	.45	27	22	-.18	.46	26				
23	-.14	.45	26	23	.02	.04	3				

TABLE 6

Pupil Relative Gain Scores on CTBS by Class and Grade for Site B

	CTBS Reading				CTBS Language		
Class	Rel. Gain Score	SD	N	Class	Rel. Gain Score	SD	N
Grade 2							
1	.26	.21	6	1	.33	.28	6
3	-.40	.95	8	3	-.38	.79	8
4	.94	.22	4	5	.26	.86	7
5	-.12	.92	7	6	.12	.59	5
6	-.26	.28	5	7	-.33	.59	4
Grade 3							
9	.06	.53	7	9	.26	.57	7
10	-.36	.67	12	10	-.13	1.00	12
11	.11	1.07	5	11	.02	.36	5
12	.37	.65	9	12	-.04	.42	9
Grade 4							
13	-.54	.44	9	13	-.51	.76	9
14	.31	.58	10	14	.13	.50	10
16	.20	.71	9	16	.37	.62	9
Grade 5							
18	-.09	.40	9	18	-.04	.38	9
19	-.40	.44	4	19	-.24	.40	4
21	.83	1.24	7	21	.81	1.18	7
22	-.29	.35	12	22	-.37	.60	12
Grade 6							
23	-.20	.33	8	23	.10	.26	8
24	.22	1.00	7	24	-.11	.86	7

TABLE 7

Pupil Relative Gain Scores on Spanish/English Balance Tests by Class and Grade for Site B

English				Spanish			
Class	Rel. Gain Score	SD	N	Class	Rel. Gain Score	SD	N
Grade 2							
1	.35	.46	7	1	-.48	.98	7
2	.24	1.08	5	2	-.23	.69	5
3	.48	1.05	10	3	.37	.77	10
4	-.04	.88	17	4	.20	.87	17
5	-.06	.72	10	5	-.07	1.16	10
6	-.08	.90	8	6	.16	.88	8
7	-.66	.52	10	7	-.32	.75	10
Grade 3							
8	-.21	1.12	6	8	-.37	.88	6
9	.84	.48	10	9	.11	.49	9
10	-.30	.96	14	10	-.18	1.12	14
11	.01	.94	8	11	.41	.68	8
12	.01	.90	9	12	.06	.79	9
Grade 4							
13	-.09	.90	12	13	.10	.73	12
14	.21	.70	13	14	.33	.86	13
15	-.57	1.28	7	15	-.35	.93	7
16	.15	.82	15	16	-.19	.37	15
17	.02	.49	7	17	-.03	.73	7
Grade 5							
18	.20	.50	15	18	.17	.83	15
19	.31	.88	8	19	-.31	.89	8
20	.04	.45	5	20	.42	.75	5
21	-.69	1.30	5	22	-.14	.46	15
22	-.32	.87	15				
Grade 6							
23	.21	.49	7	23	.09	.73	7
24	-.10	.59	14	24	-.05	.87	14

the students' adjusted gains to determine whether the four types of "teams" differed significantly in terms of class gain scores. We then computed correlations between class means of student gain scores and the teachers' and aides' test scores.

Results

Spanish Proficiency

In both sites A and B, the analysis of variance performed on the relative mean gains of the four types of teacher-aide teams showed no significant differences on any of the student criterion measures (Table 8). In site A, performance on both general Spanish proficiency and writing proficiency failed to correlate significantly with pupil adjusted gain scores (Table 9). However, in site B, the teachers' performance on writing proficiency was significantly correlated with the pupils' adjusted gain scores on the CTBS Language and Reading tests (Table 10). The relationship between the aides' writing proficiency and adjusted student gains on the CTBS was strong, but not significant. Nonetheless, aides who scored high on general Spanish proficiency taught classes that performed significantly better on CTBS Reading.

Methods of Teaching Reading in Spanish

The analysis of variance showed a significant relation of teacher-aide groupings on this test to results on CTBS Language in site A and CTBS Reading in site B (see Table 8). A closer look at the analysis of variance (Appendix A) shows that for site A the greatest gains in CTBS Language scores were achieved by the pupils taught by the teacher-aide group made up of the low-achieving teachers and low-achieving aides. The group taught by the

TABLE 8

Summary of Analysis of Variance of Pupil Test Scores
by Teacher-Aide Groups

Teacher Test	Site	Pupil Test	df	F
General Spanish Proficiency	A	CTBS Reading	3,19	.55
		CTBS Language	3,19	.26
		Spanish Oral Comp.	3,4	1.42
	B	CTBS Reading	3,3	1.30
		CTBS Language	3,4	.74
		Balance Tests: English	3,7	.70
		Balance Tests: Spanish	3,7	.60
Spanish Reading Methods	A	CTBS Reading	3,19	1.70
		CTBS Language	3,19	4.25*
	B	CTBS Reading	3,6	4.61*
		CTBS Language	3,6	.46
		Balance Tests: English	3,10	.07
		Balance Tests: Spanish	3,10	.84
English as a Second Language	A	CTBS Reading	3,19	1.70
		CTBS Language	3,19	.94
Spanish as a Second Language	A	CTBS Reading	3,19	1.00
		CTBS Language	3,19	2.28
		Spanish Oral Comp.	3,4	.73
Spanish of the Southwest	A	CTBS Reading	3,19	.19
		CTBS Language	3,19	.53
		Spanish Oral Comp.	3,4	2.97
Spanish Varieties Attitude Scale	A	CTBS Reading	3,17	3.29*
		CTBS Language	3,17	.47
		Spanish Oral Comp.	3,3	.30

*$p < .05$

low-achieving teachers and high-achieving aides is next. In other words, the relation between teacher performance and pupil achievement is the reverse of what one might expect. An examination of the analysis of variance of the CTBS Reading scores in site B (Appendix A) tells a somewhat confusing story because the significant difference between teacher-aide teams is that between

TABLE 9

Correlations of Pupil Mean Relative Gain Scores
with Teacher and Aide Scores at Site A
(N = 23 teachers, 23 aides)

	SP		RM		ESL		SSL		SW		Attitude[a] (SW)	
	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides
CTBS Language	-.17	.09	-.21	-.18	-.31	-.02	-.35*	-.27	-.29	.01	-.10	.09
CTBS Reading	-.28	.03	-.10	-.18	-.35*	.03	-.27	-.09	-.30	-.24	-.42*	.20

Note: The small number of classes for which pupils scores on Spanish Comprehension were available (see Table 5) precluded the use of correlations between these scores and scores on the teacher tests.

[a]N = 22 for teachers and aides *p < .05

TABLE 10

Correlations of Pupil Mean Relative Gain Scores with Teacher and Aide
Scores at Site B

	GSP		WP		SLA		RM		ESL		SSL	
	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides	Tchrs.	Aides
CTBS Language	-.04 (17)	.53 (8)	.56* (11)	.47 (7)	.18 (16)	-.21 (5)	-.24 (16)	.27 (10)	-.20 (16)	.31 (10)	-.24 (17)	
CTBS Reading	.14 (17)	.70* (7)	.53* (11)	.57 (6)	.16 (16)	.55 (4)	-.65** (16)	-.03 (10)	.17 (16)	-.46 (10)	.04 (17)	
Balance Tests English	-.23 (22)	-.32 (12)	.13 (16)	-.04 (10)	-.18 (20)	-.53 (8)	.01 (20)	-.39 (15)	-.19 (21)	-.19 (15)	-.16 (22)	
Balance Tests Spanish	-.12 (22)	-.21 (12)	-.03 (10)	-.13 (10)	-.05 (20)	.15 (8)	-.14 (20)	-.42 (15)	-.26 (21)	-.01 (15)	-.04 (22)	

Note: Numbers in parentheses are N's. *p < .05 **p < .01

the scores of high-performing teacher/low-performing aides and the scores of low-performing teachers and low-performing aides. The correlational analysis shows that the relationships between pupil achievement and teachers' and aides' scores on Spanish Reading Methods are all negative (Tables 9, 10). For site B the negative correlation ($r = -.65$) between teachers' scores on Spanish Reading Methods and pupils' gains on CTBS Reading even reaches the $p < .01$ level of significance (see Table 10).

Methods of Teaching English and Spanish as Second Languages

The analysis of variance of mean class gain scores by teacher-aide groups did not show teacher-aide groups to be significant sources of variance in class gains (Table 8). The correlations of teacher and aide scores with adjusted mean class gain scores tend to be negative for both tests at both sites. Two correlations obtained at site A (SSL with CTBS Language; ESL with CTBS Reading) reach the $p < .05$ level of significance, shown in Table 9.

Spanish of the Southwest.

This test and the accompanying attitude scale were administered in site A only. Performance on the test did not show any significant relationship to pupil gains either through the ANOVA or correlational analyses (Tables 7 and 8). This may be partly explained by the fact that pupil measures in both English and Spanish strongly favored standard language use. The attitude scale, however, showed some significant results. A positive attitude on the part of the teachers toward varieties of Spanish appears to have had adverse effects on pupils' scores on CTBS Reading (see correlation in Tables 8 and 9). This relationship between teacher attitude and pupil achievement in reading is probably more complex than is shown by the correlational analysis: The analysis of variance by teacher-aide groups also shows a

significant impact of attitudes toward Spanish of the Southwest on achievement in reading (Table 7). The analyses of variance (see Appendix A) suggest that the highest achieving classes are taught by a combination of low attitude teacher-high attitude aide. This result suggests that for this particular student group the possibly damaging effects of low teacher attitudes were offset by high, positive attitudes on the part of the aides.

Conclusions

In general, it appears that whereas teachers' and aides' scores on Spanish Proficiency significantly contributed to pupil gains, high performance on ESL, SSL, and Spanish Reading Methods did not. These findings, it must be emphasized, are only suggestive. The student criterion measures were far from ideal and were not directly related to the aims of the teacher tests. For example, there was no Spanish reading measure for the pupils among the criterion measures. Some of the criterion measures may not have been adequate for the grade level of the pupils. For instance, gains on the SCRDT Spanish/English Balance Test of grammar were minimal, since pupils scored high on both the pretest and the posttest.

The relations of personal characteristics of teachers and aides to performance on the teacher tests provide some insights into the results obtained in this study. As mentioned before, considerable data on the teachers' and aides' background, language use patterns, professional preparation, and experience were collected. On the basis of cursory analyses of these data it appears that most of the teachers and aides who performed well on the ESL, SSL, and Spanish Reading Methods tests were young Anglo-Americans who had a high degree of education and/or experience and tended

to use English in their interactions with their parents and their children (see Appendixes B and C). These data support the widely held hypothesis that those teachers in bilingual education programs who are well prepared in methods and linguistics and are likely to perform well on tests such as ours are, by and large, Anglo--or at least highly assimilated--and use the English language predominantly. Teachers and aides who performed well in standard Spanish tended to be individuals of hispanic background who used Spanish frequently (see Appendixes D and E). Similarly, teachers who had more positive attitudes toward Southwest varieties of Spanish also used Spanish extensively; but the aides who had a positive attitude toward the dialects were not of Latin American background (see Appendix F).

As previous studies have shown, the relationship between teacher knowledge and pupil gains is complex. In the next phase of our research, we hope to observe the effect of teachers' knowledge and attitudes on their behavior in the classroom in order to determine just how their knowledge, attitudes, and classroom behavior interact to influence pupil achievement.

References

Brophy, Jere E., and Good, Thomas L. Teacher-Student Relationships: Causes and Consequences. New York: Holt, Rinehart and Winston, 1974.

California State Department of Education. Bilingual-Bicultural Education and English as a Second Language Education. A Framework for Elementary and Secondary Schools. Sacramento: Bureau of Publications, 1974.

Carter, T. P. Mexican-Americans in School: A History of Educational Neglect. New York: College Entrance Examination Board, 1970.

Center for Applied Linguistics. Guidelines for the Preparation and Certification of Teachers of Bilingual-Bicultural Education. Arlington, Va.: Center for Applied Linguistics, 1974.

Cole, M., and Bruner, J. S. "Cultural Differences and Inferences about Psychological Processes." American Psychologist, 26 (1971), 867-76.

Dion, K. "Social Desirability and the Evaluation of a Harm-Doer." Unpublished doctoral dissertation, University of Minnesota, 1970.

Dusek, J. B. "Do Teachers Bias Children's Learning?" Review of Educational Research, 45 (1975), 661-84.

Elashoff, J. D., and Snow, R. E. Pygmalion Reconsidered. Worthington, Ohio: Charles A. Jones, 1971.

Feshbach, N. Student Teacher Preferences for Elementary School Pupils Varying in Personality Characteristics. Journal of Educational Psychology, 60 (1969), 126-32.

Galarza, E., Gallegos, H., and Samora, J. Mexican-Americans in the Southwest. Santa Barbara, Ca.: McNally & Loftin, Publishers, 1969.

Heim, J., and Lewis, P. The Educational Production Function: Implications for Educational Manpower Policy. Institute of Public Employment Monograph No. 4. Ithaca, N.Y.: School of Industrial and Labor Relations, Cornell University, 1974.

Hernández, N. G. "Variables Affecting Achievement of Middle School Mexican-American Students." Review of Educational Research, 43 (1973), 1-37.

Hess, R., Shipman, V., Brophy, J., and Bear, R. (in collaboration with A. Adelberger). "The Cognitive Environments of Urban Preschool Children: Follow-up Phase." Chicago: Graduate School of Education, University of Chicago, 1969 (mimeo final report).

Lawrenz, F. "The Relationship Between Science Teacher Characteristics and Student Achievement and Attitude." Journal of Research in Science Teaching, 12 (1975), 433-37.

Merino, B. J. (Ed.) Report on the Working Conference on the SCRDT Teacher Tests for Spanish/English Bilingual Education (February 12-13, 1976). Occasional Paper No. 14. Stanford, Ca.: Stanford Center for Research and Development in Teaching, 1976.

Politzer, R. L., and Weiss, L. The Successful Foreign-Language Teacher. Philadelphia, Pa.: Center for Curriculum Development, [1971].

Ramirez, A. G., Arce-Torres, E., and Politzer, R. L. Language Attitudes and the Achievement of Bilingual Pupils. R&D Memorandum No. 146. Stanford, Ca.: Stanford Center for Research and Development in Teaching, 1976.

Rosenshine, B. Teaching Behaviors and Student Achievement. London: National Foundation for Educational Research, 1971.

Rosenthal, R., and Jacobson, L. Pygmalion in the Classroom: Teacher Expectation & Pupils' Intellectual Development. New York: Holt, Rinehart and Winston, 1968.

Rubovits, P., and Maehr, M. "Pygmalion Black and White." Journal of Personality and Social Psychology, 25 (1973), 210-18.

Seligman, G. P., Tucker, G. R., and Lambert, W. E. "The Effects of Speech Style and Other Attributes on Teachers' Attitudes toward Pupils." Language and Society, 1 (1972), 131-42.

Smith, P. D. A Comparison of the Cognitive and Audiolingual Approaches to Foreign Language Instruction. Philadelphia: Center for Curriculum Development, 1970.

Snow, R. E. "Unfinished Pygmalion." Contemporary Psychology, 14 (1969), 197-99.

Tulkin, S. R. "An Analysis of the Concept of Cultural Deprivation." Developmental Psychology, 6 (1976), 326-39.

Appendix A

Summary of Significant Results of Analysis of Variance of Mean Relative Gain Scores by Teacher-Aide Groups

1. Site A
Teacher Test: Methods of Teaching Reading in Spanish
Pupil Test : CTBS Language

Teacher-Aide Group:	Hi T Hi A	Hi T Lo A	Lo T Hi A	Lo T Lo A	
$\bar{X}$	-.13	-.13	.03	.13	$F = 4.25^{*}$ (df = 3.19)
S.D.	.25	.12	.17	.14	
Class N	5	5	5	8	$^{*}p < .02$
Pupil N	107	82	117	89	

2. Site A
Teacher Test: Attitude Scale: Spanish of the Southwest
Pupil Test : CTBS Reading

Teacher-Aide Group:	Hi T Hi A	Hi T Lo A	Lo T Hi A	Lo T Lo A	
$\bar{X}$	-.15	-.15	.27	-.04	$F = 3.29^{*}$ (df = 3.17)
S.D.	.18	22	32	27	
Class N	6	5	5	5	$^{*}p < .05$
Pupil N	143	104	109	120	

3. Site B
Teacher Test: Methods of Teaching Reading in Spanish
Pupil Test : CTBS Reading

Teacher-Aide Group:	Hi T Hi A	Hi T Lo A	Lo T Hi A	Lo T Lo A	
$\bar{X}$	.24	-.18	-.17	.94	$F = 4.61^{*}$ (df = 3.6)
S.D.	.03	.33	.33	-	
Class N	2	5	2	1	$^{*}p < .05$
Pupil N	13	44	11	4	

Note: Scheffe's test for significant pairwise differences showed that significant differences were between low teacher, low aide and high teacher, low aide: $F = 3.90$, $p < .05$.

Appendix B

Significant Correlations of Teacher Characteristics with ESL and SSL Test Scores

Characteristic	Site A	Site B
SSL Test		
Ethnic background		
Hispanic	-.34* (23)	-.40* (26)
Mexican-American	-.34* (23)	-.53** (26)
Place lived longest		
Southwest		-.32* (26)
ESL Test		
Ethnic background		
Hispanic	-.46* (23)	-.59** (25)
Mexican-American	-.40* (23)	-.56** (25)
Language use patterns		
Read books in Spanish frequently	-.51** (23)	
Use only English with parents	.43* (21)	
Professional preparation		
Courses in SSL	.35* (23)	
Place lived longest		
Southwest		-.51** (25)
Place grew up		
Southwest		-.36* (26)

Note: None of the aides' results were statistically significant.

*$p < .05$

**$p < .01$

Appendix C

Significant Correlations of Teacher and Aide Characteristics with Spanish Reading Methods Scores

Characteristic	Site A Teachers	Site A Aides	Site B Teachers	Site B Aides
Ethnic background				
Mexican-American	-.37* (23)	.37* (23)		
Hispanic	-.37* (23)		-.41* (24)	
Latino			-.37* (24)	
Language use patterns				
Use English with spouse	.36* (24)			-.47* (14)
Use only English with parents			.36* (25)	
Birthplace				
Of mother-- Latin America		-.42* (23)		
Of father-- Latin America		-.42* (23)		
Age			-.37* (24)	-.43* (16)
Professional preparation				
Courses in SSL			.41* (25)	

*$p < .05$

Appendix D

Significant Correlations of Teacher and Aide Characteristics with Spanish Proficiency Scores

Characteristic	Site A Teachers	Site A Aides	Site B Teachers	Site B Aides
Language use				
Use only English with children	-.67** (12)	-.52** (21)		-.52** (21)
Read Spanish books frequently	.47** (23)		.42** (22)	
Read Spanish texts frequently	.46** (23)		.75 (22)	
Read Spanish newspapers frequently	.40* (22)	.45* (22)	.58** (22)	.45* (22)
Personal history				
Grew up in Latin America	.42* (23)			
Grew up in Southwest		-.42* (23)		-.42* (23)
Have spent most of lifetime in Latin America	.42* (23)			
Professional preparation				
Courses in Spanish literature	.48** (23)		.38* (27)	
Courses in linguistics	-.39* (23)	-.30 (23)		

*$p < .05$

**$p < .01$

Appendix E

Significant Correlations of Teacher and Aide Characteristics with Spanish Writing Proficiency Scores

(Site B)

Teachers		Aides	
Read Spanish textbooks frequently	.69** (16)	Born in Latin America	.83** (10)
Father's birthplace in Latin America	-.48** (19)	Born in the Southwest	-.83** (10)
Read newspapers in Spanish frequently	.48* (16)	Father's birthplace in the Southwest	-.62* (10)
Have taken courses in ESL	-.45* (26)	Mexican-American ethnic background	-.54* (10)
Read books in Spanish frequently	.36 (16)		

Note: Site A is not included because the N for which such data could be obtained was too small.

*$p < .05$

**$p < .01$

Appendix F

Significant Correlations of Teacher and Aide Characteristics with Performance on Test and Attitude Scale on Spanish of the Southwest

Site A

Attitude Scale			
Teachers		Aides	
Read newspapers in Spanish frequently	.50** (22)	Latin-American ethnic background	-.47** (23)
Use only English with parents	-.44* (21)	Mother's birthplace in Latin America	-.44* (23)
Use English and Spanish/ English with parents	-.43* (21)	Father's birthplace in Latin America	-.44* (23)
Read textbooks in Spanish frequently	.39* (23)		
Have taken courses in linguistics	-.37* (23)		

Spanish of the Southwest			
Teachers		Aides	
Use only English with children	-.74** (12)	Use only English with children	-.56** (21)
Have taken courses in Spanish literature	-.47** (23)		
Read books in Spanish frequently	.47** (23)		
Read textbooks in Spanish frequently	.46** (23)		
Read newspapers in Spanish frequently	.40* (22)		.51** (22)
Use only English with parents	-.27* (21)		

*p < .05

**p < .01